

In the Claims

1. (currently amended) An isolated, purified, or recombinant polynucleotide comprising a contiguous span of at least 150, 200, 500, 1000, 2000, 5000, 10000, or 50000 nucleotides of any one of SEQ ID Nos: 1, 2, 4 or the complement thereof, wherein said span includes a AA4RP-related biallelic marker in said sequence.

2. (currently amended) The isolated, purified, or recombinant polynucleotide of Claim 1, wherein said polynucleotide is selected from the group consisting of:

(a) an isolated, purified, or recombinant polynucleotide comprising a contiguous span of at least 12150, 200, 500, 1000, 2000, 5000, 10000, or 50000 nucleotides of SEQ ID No 1 or the complements thereof, wherein said contiguous span comprises at least one of the nucleotide positions of SEQ ID No 1 selected from the group consisting of a T at position 1239, a T at position 12347, a C at position 13269, an A at position 13475, a T at position 15241, a G at position 42218, an A at position 45442, and a T at position 77058;

(b) an isolated, purified, or recombinant polynucleotide comprising a contiguous span of at least 12 nucleotides of SEQ ID No 1 or the complements thereof, wherein said contiguous span comprises at least 10 consecutive nucleotides of at least one of the nucleotide positions of SEQ ID No 1, wherein said positions are selected from the group consisting of 12947 to 12958, 13470 to 13526, 13641 to 13752, and 14271 to 15968;

(c) an isolated, purified, or recombinant polynucleotide comprising a contiguous span of at least 12 nucleotides of SEQ ID No 4 or the complements thereof, wherein said contiguous span comprises at least one of the nucleotide positions of SEQ ID No 4 selected from the group consisting of a T at position 319, a C at position 1241, an A at position 1447, and a T at position 3213;

(d) an isolated, purified, or recombinant polynucleotide comprising a contiguous span of at least 12 nucleotides of SEQ ID No 4 or the complements thereof, wherein said contiguous span comprises at least 10 consecutive nucleotides of at least one of the

~~nucleotide positions of SEQ ID No 4, wherein said positions are selected from the group consisting of 919 to 930, 1442 to 1498, 1613 to 1724 and 2243 to 3940;~~

- (e) — an isolated, purified, or recombinant polynucleotide comprising a contiguous span of at least 12 nucleotides of SEQ ID No 2 or the complements thereof;
- (f) — a polynucleotide according to (e), wherein said contiguous span comprises a T at position 1153;
- (g) — a polynucleotide according to (f) wherein said contiguous span comprises at least 10 consecutive nucleotides selected within positions 21-1121;
- (h) — an isolated, purified, or recombinant polynucleotide wherein said contiguous span is 18 to 35 nucleotides in length and said biallelic marker is within 4 nucleotides of the center of said polynucleotide;
- (i) — a polynucleotide according to (h), wherein said polynucleotide consists of said contiguous span and said contiguous span is 25 nucleotides in length and said biallelic marker is at the center of said polynucleotide; and
- (j) — an isolated, purified, or recombinant polynucleotide, wherein the 3' end of said contiguous span is located at the 3' end of said polynucleotide and said biallelic marker is present at the 3' end of said polynucleotide.

3. (original) A recombinant vector comprising a polynucleotide of Claim 1.

4. (original) A host cell comprising a recombinant vector according to claim 3.

Claims 5-14 (canceled)

15. (original) An isolated, purified, or recombinant polynucleotide that encodes a polypeptide comprising a contiguous span of at least 6 amino acids in SEQ ID No 3.

Claim 16-17 (canceled)

Claim 18 (new): The polynucleotide of claim 15, wherein said polynucleotide comprises at least 100, 150, 200, 500, or 1000 nucleotides of SEQ ID NO: 2 and said polynucleotide comprises a T at position 1153.

Claim 19 (new) The polynucleotide of claim 15, wherein said polynucleotide comprises SEQ ID NO: 2.

Claim 20 (new): The polynucleotide according to claim 15, wherein said polynucleotide comprises a heterologous polynucleotide sequence fused to a polynucleotide consisting of a contiguous span of nucleotides that encode a polypeptide consisting of Gln22 to Phe27; Gln33 to Arg40; Ser78 to Met92; Gln128 to Thr133; Gly265 to Pro274; Phe288 to Thr292; or Leu355 to His360 of SEQ ID NO:3.

Claim 21 (new): The polynucleotide according to claim 15, further comprising a heterologous polynucleotide sequence.

Claim 22 (new): The polynucleotide according to claim 15, wherein said polynucleotide consists of a contiguous span of nucleotides that encode a polypeptide consisting of Gln22 to Phe27; Gln33 to Arg40; Ser78 to Met92; Gln128 to Thr133; Gly265 to Pro274; Phe288 to Thr292; or Leu355 to His360 of SEQ ID NO:3.

Claim 23 (new) The polynucleotide according to claim 1, wherein said contiguous span comprises a contiguous span of at least 150 nucleotides of SEQ ID No: 1.

Claim 24 (new) The polynucleotide according to claim 1, wherein said contiguous span comprises a contiguous span of at least 200 nucleotides of SEQ ID No: 1.

Claim 25 (new) The polynucleotide according to claim 1, wherein said contiguous span comprises a contiguous span of at least 500 nucleotides of SEQ ID No: 1.

Claim 26 (new)      The polynucleotide according to claim 1, wherein said contiguous span comprises a contiguous span of at least 1000 nucleotides of SEQ ID No: 1.

Claim 27 (new)      The polynucleotide according to claim 1, wherein said contiguous span comprises a contiguous span of at least 2000 nucleotides of SEQ ID No: 1.

Claim 28 (new)      The polynucleotide according to claim 1, wherein said contiguous span comprises a contiguous span of at least 5000 nucleotides of SEQ ID No: 1.

Claim 29 (new)      The polynucleotide according to claim 1, wherein said contiguous span comprises a contiguous span of at least 10000 nucleotides of SEQ ID No: 1.

Claim 30 (new)      The polynucleotide according to claim 1, wherein said contiguous span comprises a contiguous span of at least 50000 nucleotides of SEQ ID No: 1.

Claim 31 (new)      The polynucleotide according to claim 1, wherein said contiguous span comprises SEQ ID No: 1.

Claim 32 (new):      The polynucleotide of claim 18, wherein said polynucleotide comprises a contiguous span at least 100 nucleotides of SEQ ID NO: 2.

Claim 33 (new):      The polynucleotide of claim 18, wherein said polynucleotide comprises a contiguous span at least 150 nucleotides of SEQ ID NO: 2.

Claim 34 (new):      The polynucleotide of claim 18, wherein said polynucleotide comprises a contiguous span at least 200 nucleotides of SEQ ID NO: 2.

Claim 35 (new):      The polynucleotide of claim 18, wherein said polynucleotide comprises a contiguous span at least 500 nucleotides of SEQ ID NO: 2.

Claim 36 (new): The polynucleotide of claim 18, wherein said polynucleotide comprises a contiguous span at least 1000 nucleotides of SEQ ID NO: 2.